REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

Upon entry of this Amendment, Claims 1-4 and 8-19 will be pending, of which Claim 1 will have been amended and Claim 7 will have been cancelled without prejudice or disclaimer.

The indication that Claims 7, 13 and 16 have been allowed is appreciatively noted. The indication that Claims 2 and 8 would be allowable if rewritten to include the limitations of any claims on which they depend is also appreciatively noted. These claims are retained.

Claims 1, 3-4 and 14-15 stand rejected under 35 USC 102(e) over U.S. Patent No. 6,642,564 to Ogawa ("Ogawa"). This contention is respectfully traversed.

To establish a *prima facie* case of anticipation, a rejection must show that each and every element as set forth in the claim is found either expressly or inherently in a single prior art reference, e.g. M.P.E.P. §2131.

Claim 1 has been amended, and now requires, inter alia, a vertical ferrocapacitor formed by:

a.) depositing a ferroelectric material on an insulating layer;

b.) etching the ferroelectric material to form openings in the ferroelectric material;

c.) depositing an electrode layer on the openings in the ferroelectric material;

d.) etching to form gaps in the electrode layer and the insulating layer at the bottom of the openings; and

e.) inserting conductive material into the gaps at least on a portion of the electrode layer.

Applicant traverses the summary of Ogawa in the Official Action. Instead Applicant submits that Ogawa in embodiment 5 at col 11-14 and fig. 6-7C discloses a horizontal capacitor formed by:

i. depositing a BST film 34 on lower electrode 33

ii. etching to form gaps in the BST film 34

iii. after a number of other layers are deposited, a connection conductor film 37 is deposited in the gap 59 and then a second interlayer insulating film 22 is deposited on the connection conductor film 37

iv. a bore 60 is formed through the second interlayer insulating film 22 and the connection conductor film 37 to form an insulating sidewall 52

v. a Cu film is deposited into the bore to form an upper bit line plug 51.

Applicant therefore submits that (a) is not taught either expressly or inherently in (i). Ogawa's BST film 34 is primarily deposited on the lower electrode 33, not an insulating layer as required by claim 1.

Similarly (b) is not taught either expressly or inherently in (ii). The BST film 34 is completely etched away to form a gap, not an opening as required by claim 1.

(c) is not taught either expressly or inherently in (iii). The connection conductor film 37 is deposited in gap 59, not on the ferroelectric layer in the openings as required by claim 1.

(d) is not taught either expressly or inherently in (iv). The bore 60 is made through the second interlayer insulating film 22, not the insulating layer under the ferroelectric material as required by claim 1.

(e) is not taught either expressly or inherently in (v). The upper bit line plug 51 is formed on the insulating sidewall 52, not the electrode layer as required by claim 1.

It is clear that the horizontal capacitor of Ogawa is not relevant to the vertical capacitor in claim 1. The problem identified by the present inventors is not taught or suggested in Ogawa. The method of claim 1 provides a solution to that problem that could not be achieved with the method in Ogawa.

As indicated previously, if charged with designing a vertical capacitor, a reader of ordinary skill in the art is unlikely to refer to teachings regarding horizontal capacitors, without the benefit of hindsight.

Ogawa does not disclose the required features of claim 1. Applicant submits Claim 1 is patentable over Ogawa.

Claims 3-4 depend from claim 1 and add further limitations thereto. The submissions above in relation to claim 1 are repeated in relation to the patentability of claims 3-4. It is respectfully submitted that these dependent claims are allowable by reason of depending from an allowable claim as well as for adding new limitations.

Claims 14-15 have many limitations in common with claim 1 as well as further limitations thereto, that are not found either expressly or inherently in Ogawa. The submissions above in relation to claim 1 are repeated in relation to the patentability of claims 14-15. It is respectfully submitted that these claims are allowable by reason of depending those above arguments as well as for the additional novel limitations.

Claims 9 and 17 stand rejected under 35 USC 103(a) over U.S. Patent No. 6642564 to Ogawa ("Ogawa") in view of U.S. Patent Application No. 2003/0227799 to Higo et al ("Higo"). This contention is respectfully traversed.

To establish a *prima facie* case of obviousness, the rejection must satisfy three basic criteria M.P.E.P. § 2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to a reader of ordinary skill in the art, as of the date of invention, to modify the reference or to combine the reference teachings. The mere fact that references can be

combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990), or unless the modification is based on common sense, *KSR INT'L CO. v. TELEFLEX INC*, 550 U. S. _____ (2007). Second there must be a reasonable expectation of success. Finally the prior art references when combined must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable chance of success must both be found in the prior art, not in the applicant's disclosure. *In re Vaeck*, 947 F.2d 488,20 USPQ2d 1438 (Fed. Cir. 1991).

The insulating layer in at least one embodiment is the layer between the matrix and the ferroelectric material. The Al_2O_3 layer in Higo is different, as it is in between ferroelectric layers. Accordingly the passage referred to by the rejection would not motivate a reader of ordinary skill in the art to replace the first interlayer insulating film 18 (which is not between ferroelectric layers) with Al_2O_3.

Higo does not teach or suggest the limitations of claims 9 or 17 that are not found either expressly or inherently in Ogawa. Even if the combination was valid (which is not admitted) the BST film 34 would still primarily be deposited on the lower electrode 33, not an insulating layer as required by claim 1.

Ogawa, Higo or any valid combination thereof, do not teach or suggest a method for forming a vertical ferrocapacitor having the required limitations of claims 9 or 17. Accordingly claims 9 and 17 are patentable over Ogawa in view of Higo.

Claims 10 stands rejected under 35 USC 103(a) over U.S. Patent No. 6642564 to Ogawa ("Ogawa") in view of U.S. Patent Application No. 2003/0155595 to Okita et al ("Okita"). This contention is respectfully traversed.

Okita does not teach or suggest the limitations of claim 1 that are not found either expressly or inherently in Ogawa. The submissions in relation to Okita in past responses are incorporated herein by reference. Both references are horizontal capacitors and would not be considered by a reader of ordinary skill in the art of vertical ferrocapacitors.

Ogawa, Okita or any valid combination thereof, do not teach or suggest a method for forming a vertical ferrocapacitor having the required limitations of claim 10. Accordingly claim 10 is patentable over Ogawa in view of Okita.

Claims 11-12 and 18-19 stand rejected under 35 USC 103(a) over U.S. Patent No. 6642564 to Ogawa ("Ogawa") in view of U.S. Patent No. 6753437 to Sagae et al ("Sagae"). This contention is respectfully traversed.

Sagae does not teach or suggest the limitations of claims 11, 12, 18 or 19 that are not found either expressly or

inherently in Ogawa. Even if the combination was valid (which is not admitted) connection conductor film 37 would still not have been deposited in openings in the ferroelectric material and subsequently had conductive material inserted on it as required by claims 11, 12, 18 or 19.

Ogawa, Sagae or any valid combination thereof, do not teach or suggest a method for forming a vertical ferrocapacitor having the required limitations of claims 11, 12, 18 or 19. Accordingly claims 11, 12, 18 and 19 are patentable over Ogawa in view of Sagae.

It is believed that all of the pending claims have been addressed in this paper. However, failure to address a specific rejection, issue or comment, does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above are not intended to be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicants ask that all claims be allowed. No fee is believed to be due, however please apply any applicable charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 6/1/07

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